

## CONSTELLATION-MULTIPLEXED TRANSMITTER AND RECEIVER

## 5 ABSTRACT OF THE DISCLOSURE

10 A device of dynamic communication of information allows, on the average, non-integer bits per symbol transmission, using a compact code set or a partial response decoding receiver. A stream of selectable predetermined integer bits, e.g.,  $k$  or  $k+1$  data bits, is grouped into a selectable integer number of bit vectors which then are mapped onto corresponding signal constellations forming transmission symbols. Two or more symbols can be grouped and further encoded, so that a symbol is spread across the two or more symbols being communicated. Sequence estimation using, for example, maximum likelihood techniques, as informed by noise estimates relative to the received signal. Each branch metric in computing the path metric of a considered sequence at the receiver is weighted by the inverse of the noise power. It is desirable that the constellation selection, sequence estimation and noise estimation be performed continuously and dynamically.

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